The Art & Science of Sub-Slab Depressurization (for Radon and VOCs)

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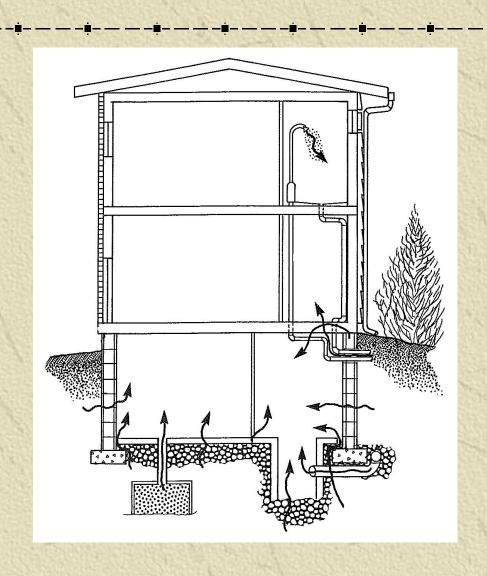




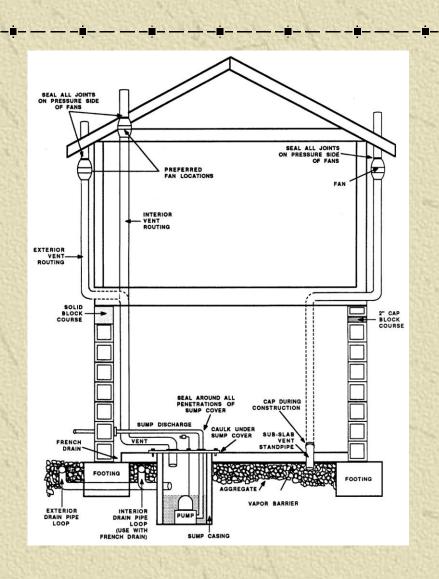
* Soil Gas Entry - How does soil gas containing radon or volatile organic compounds permeate the building foundation and enter the building envelope.

- * Active Soil Depressurization (ASD) System Operation How an active soil depressurization (ASD) mitigation is designed to work.
- **Building Investigation** Gather core information by walking through and around the building to identify the extent of the building footprint including all of the characteristics of the foundation.
- ** Performing Diagnostics and Designing the ASD System Select locations for test suction holes; visually inspecting sub-slab material; determining locations to test Pressure Field Extension (PFE); using a shop vacuum and digital micro manometer to evaluate communication and potential for PFE. Generate the information needed to size your fan and pipes properly, so your system is strong enough to produce the required pressure field without wasting energy or money on oversized systems.
- **Various Applications of ASD** Sub Slab Depressurization (SSD), Drain Tile Depressurization (DTD), Block Wall Depressurization (BWD), Sub Membrane Depressurization (SMD)
- **Post Mitigation Testing -** Verify integrity of fan mounting seals and all joints in vent piping. Verify pressure field extension. Test for back drafting of all natural draft combustion appliances.

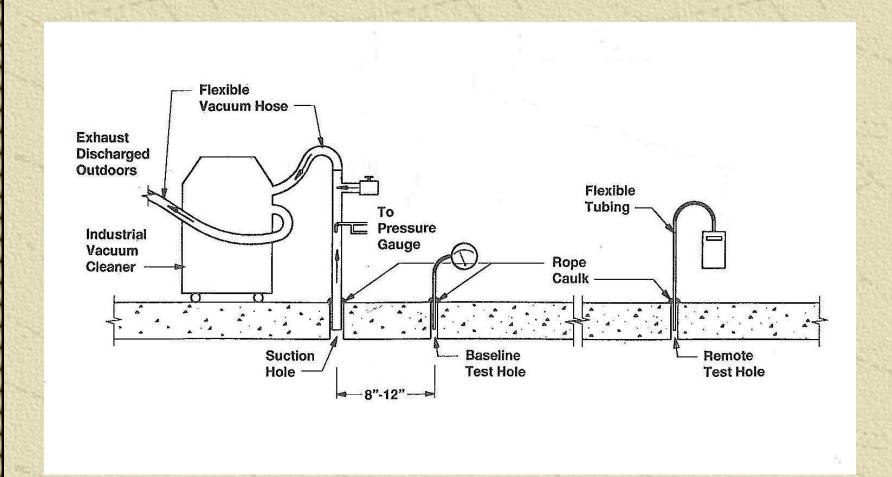
Soil Gas Entry Into Structures



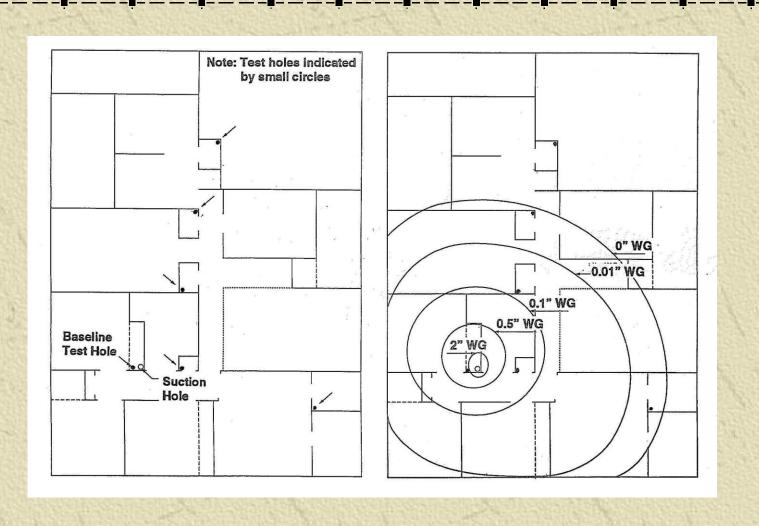
ASD System Operation



Design & Installation of ASD Systems



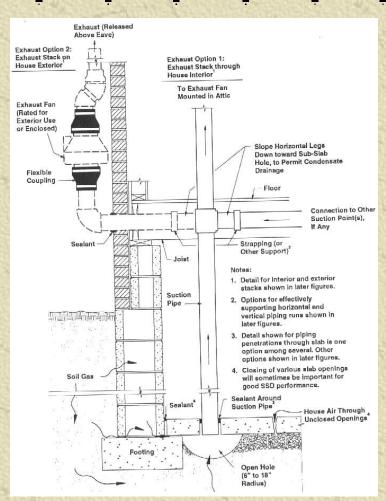
Design & Installation of ASD Systems



Active Soil Depressurization Systems

Exhaust Option 2:

Exterior Stack



shown later. Flexible Coupling 3. Alternative sump cover designs are Strapping discussed later. Exhaust Fan (or Other (Rated for 4. Options for supporting horizontal and Support) Exterior Use vertical piping runs are shown in later or Enclosed Straight Fitting 5. Detail for Interior and exterior stacks is shown in later figures. 6. Closing various slab openings, especially the perimeter wall/floor joint, will sometimes be important for good sump/DTD performance. Slope Horizontal Discharge Pipe Down Toward Pipe Suction Pipe Suction Caulk or Grade Level Grommets to Seal Penetrations Sealant Around Check Valve Masonry Bolt Sealant Cover Slab Footing Footing Soil **Existing Interior** Hole in Drain Tile Loop Wate Drain Tile Circling House **Near Suction** Sump Liner Submersible Silicone Caulk) Sump Pump

Exhaust Option 1:

To Exhaust Fan

Mounted in Attic

Interior Stack

Notes:

1. Figure depicts suction pipe installed

2. Detail shown for pipe penetration

tile can vary. Other options are

remote from sump. Suction pipe could

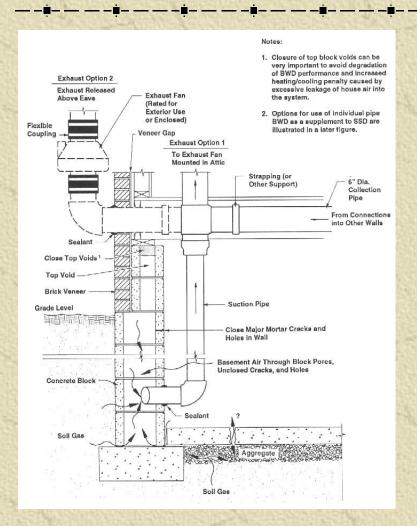
also be installed through sump cover.

through slab and connection to drain

Sub-Slab Depressurization (SSD)

Drain-Tile Depressurization (DTD)

Active Soil Depressurization Systems



1. The perforated piping is depicted here as a straight **Exhaust Option 2** length down the center of the crawl space. Exhaust Released Alternative configurations are discussed in the text. 2. The perforated piping depicted in the Inset is flexible corrugated piping. Rigid perforated Schedule 40 pipe could also be used. 3. The membrane seams should always be sealed near the perforated piping. Sealing of remote seams may not always be necessary, but is advisable. Flexible 4. The membrane can often be effectively sealed against Coupling the foundation wall using a continuous bead of an appropriate sealant. Other options for sealing the Exhaust Fan membrane against the wall are discussed in the text. (Rated for Exterior Use **Exhaust Option 1** or Enclosed) To Exhaust Fan Mounted in Attic Strapping (or Other Support) Will Sometimes Be Necessary Suction Sealant Slope Horizontal Leg Down Toward Membrane Sealant Screws Hollow-Block Foundation Wall -Membrane Sealed Against Wall with Bead of Caulk or Adhesive Grade Level THE PROPERTY. Sealant Perforated Piping Hose Clamp Membrane Sealant Dirt Floor in Crawl Space Adjoining Sheets of Length of Perforated Membrane Overlapped Pipe at Central Location, by About 12 Inches, Connected to Suction Pipe Sealed with Caulk Using Rigid PVC T-Fitting or Other Adhesive or 90° Fibow (See Inset)

Block-Wall Depressurization (BWD)

Sub-Membrane Depressurization (SMD)

Diagnostic Tools



